Radiaire aethers van koolstofetramethanol

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VII. Summary.

The purpose of this research was to prepare and to study the radiary ethers of carbontetramethanol (pentaerythrol). Only the tetraethyl ether was known. For the preparation of the aliphatic ethers carbontetramethylbromide was heated with a solution of sodium in the required alcohol:

$$C(CH_2Br)_4 + 4\ RONa \rightarrow C(CH_2OR)_4 + 4\ NaBr.$$

In this way the methyl, ethyl, propyl and cetyl ethers were prepared. The methyl and cetyl ethers are solids. Sodium isopropylate gave a partly substituted product and sodium tert.butylate did not react. The aliphatic ethers are decomposed by hydroiodic acid.

The aromatic ethers were prepared by heating carbontetramethylbromide with the corresponding sodium phenolate in alcoholic solution at about 200°. They are stable compounds, which are not attacked by hydroiodic acid. With aluminium chloride, however, reactions take place. The aromatic ethers are crystalline; the crystallographic properties of some of these were examined.

Heating of carbontetramethylbromide and sodium phenolate in phenolic solution gave an isomeride of the tetraphenyl ether. Judging by the method of preparation, it was the tetra-o-hydroxy-tetrabenzylmethane:

$$C(CH_2Br)_4 + 4\ C_6H_5ONa \rightarrow C(CH_2C_6H_4OH)_4 + 4\ NaBr.$$

The formula of tetra-p-hydroxy-tetrabenzylmethane was rejected, because the product does not show phenolic properties. An attempt was made to explain this cryptophenolic character. Treatment of the tetraphenyl ether with aluminium chloride yielded the same isomeride.

A short account was given of a research of R. A. Smith, who studied the reactions of other phenyl ethers with aluminium chloride. His reaction products were substituted mono- and di-alkylphenols.

These results support the structural formula given to the isomeride of the tetraphenyl ether of carbontetramethanol.

Treated with aluminium chloride, the tetra-p-chlorophenyl ether and the tetra-p-tolyl ether did not give isomerides, but di-substituted phenols. However, the structure of these compounds is probably different, for, in the case a phenol were substituted in two ortho-positions by the same tetramethylmethane group, the product would be a highly strained spirocyclic molecule. Another structural formula of a strainless molecule was proposed.